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PATENT APPLICATION
ATTORNEY DOCKET NO 213160

Claims

- (c1) A sub-sea controller (31) located under the sea level for managing a plurality of tools in a sub-sea well installation, the sub-sea controller (31) comprising:
 - downloading means to download an application module (35_a) to the sub-sea controller (31); and
 - a virtual machine (36) to execute the downloaded application module (35_a).
- (c2) The sub-sea controller (412) according to claim 1, further comprising:
 - a native application (47) implemented within the sub-sea controller (412); and
 - a native interface (48) implemented within the sub-sea controller (412), the native interface (48) enabling the application module (45_a) to access the native application (47).
- (c3) The sub-sea controller (412) according to claim 2, wherein:
 - the native interface (48) enables the native application (47) to access the application module (45_a).
- (c4) The sub-sea controller (412) according to any one of claims 2 or 3, further comprising:
 - a native memory wherein the native application (47) is executed; and
 - a defined memory wherein the application module (45_a) is executed, the defined memory being distinct from the native memory.
- (c5) The sub-sea controller (412) according to any one of claims 2 to 4, further comprising:
 - a protection register, the protection register authorizing an access to the native application only if a key code is written hereinto;
 - accessing means to access the protection register from the application module.

- [e6] The sub-sea controller (45_e) according to any one of claims 1 to 3, wherein the application module (45_e) contains a driver for a tool.
- [e7] A sub-sea well installation a sub-sea controller (31) according to any one of claims 1 to 6.
- [e8] A method for updating a software of a sub-sea controller (31) located under the sea level, the sub-sea controller (31) managing a plurality of tools in a sub-sea well, the method comprising:
 - downloading an application module (35_e) into the sub-sea controller (31); and
 - executing the application module (35_e) using a virtual machine (36) implemented within the sub-sea controller (31).
- [e9] The method according to claim 8, further comprising:
 - executing a native application (47) of the sub-sea controller (42) within the sub-sea controller (412);
 - executing a native interface within the sub-sea controller (412);
 - accessing the native interface from the native application (47) to exchange data with the application module (45_e).
- [e10] The method according to claim 8, further comprising:
 - executing a native application (47) of the sub-sea controller (42) within the sub-sea controller (412);
 - executing a native interface within the sub-sea controller (412);
 - accessing the native interface from the application module (45_e) to exchange data with the native application (47).
- [e11] The method according to any one of claims 9 or 10, wherein the downloading and the executing of the application module (45_e) are performed without interrupting an executing of the native application of the sub-sea controller (412).

- [c12] The method according to any one of claims 9 to 11, further comprising:
 - executing the application module (45₂) in a defined memory;
 - executing the native application (45₁) in a native memory;
 - wherein the defined memory is distinct from the native memory.
- [c13] The method according to anyone of claims 8 to 12 wherein the application module (45₂) contains a driver for a tool.